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ABSTRACT

Conducted in the Fargo and West Fargo metropolitan area, this study had as its objectives to determine: (1) opportunities for using local businesses as centers for student-learner employment, (2) the willingness of employers to take part in other types of teaching involvement, and (3) the relevance of 44 selected agricultural competency clusters necessary or useful for job entry. Questionnaires distributed to 164 agribusinesses in the area supplied the data. Conclusive findings included: (1) Generally, management representatives surveyed were willing to assist the school in providing centers for field trips, but not many were enthusiastic about providing opportunities for supervised experience programs, (2) Employment in firms that hired large numbers of part-time employees tended to be seasonal, (3) Agribusiness management and marketing clusters were considered most important for job entry of the 44 competency clusters surveyed, (4) Except for some agribusiness management and marketing clusters, the competency clusters were not commonly accepted as relevant to all types of employment, and (5) Skill type clusters were considered least important for obtaining employment. (Author/SN)

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REPORT OF THE RESEARCH STUDY

A DETERMINATION OF INSTRUCTIONAL COMMONALITIES IN AGRICULTURAL OCCUPATIONS IN THE FARGO, WEST FARGO, NORTH DAKOTA, METROPOLITAN AREA

Conducted as part of

AN EXEMPLARY PROGRAM FOR CURRICULUM DEVELOPMENT
AND IMPLEMENTATION OF THE COURSE
INTRODUCTION TO AGRI-BUSINESS

Exemplary Project in Vocational Education
Conducted Under Part D of Public Law 90-576
In Cooperation With
The North Dakota State Board for Vocational Education

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CHAPTER I

INTRODUCTION

Significance and Nature of the Study

The section of the Vocational Education Act of 1963, Public Law 88-210, dealing with education in agriculture reads in part as follows:

> Any amounts allotted (or apportioned) under such titles, Act, or Acts for agriculture may be used for vocational education in any occupation involving knowledge and skills in agricultural subjects, whether or not such occupation involves work of the farm or of the farm home, and such education may be provided without directed or supervised practice on a farm.[1]

The wording of the act implies that those involved in teaching vocational agribusiness have a knowledge and understanding of the careers for which their teaching prepares students.

In 1970, the North Dakota State Board for Vocational Education, in cooperation with the Agricultural Education Department, North Dakota State University and the Fargo Public Schools, undertook the development of an exemplary educational program of vocational education in agriculture on the secondary level. The development of the exemplary program was based in part upon the following objectives:

1. To develop a program and a curriculum in vocational education in agriculture which will be suited to the needs of the Fargo area and which will serve as an instructional model for other school districts to utilize in the development of similar programs.

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[1] Public Law 88-210, 88th Cong., H.R. 4955, Sec. 10(b), 1963, pp. 8-9 (Vocational Education Act of 1963).

2. To explore the range of occupational opportunities in agriculture where current and projected labor market supply and demand indicate manpower shortage and high labor demand.

3. To develop curricula, methodologies, field experiences, laboratory demonstrations, visitations, guest lecture series and other educational programs and devices which will provide student insight into the career opportunities available within the agribusiness and related agricultural fields.[2]

To develop curricula in keeping with the objectives set forth in the exemplary proposal, further study of the agricultural businesses within the immediate school district was deemed necessary. Identifying the types of agricultural employment in the area and securing information relating to the agricultural competency clusters needed by persons employed seemed useful in designing programs of the vocational agribusiness department to be more effective in meeting the needs of the students and the community.

Purpose of the Study

The purpose of the study was to determine occupational commonalities in selected agribusiness occupations in the Fargo and West Fargo metropolitan area through the evaluation of agricultural competency clusters considered to be necessary or useful but not necessary for job entry employment.

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[2]"An Exemplary Program Proposal for the Curriculum Development and Implementation of the Course, Introduction to Agribusiness," proposal to State Board for Vocational Education, Sec. 611.2, paragraphs 1-3, January 20, 1970.

Specific Objectives of the Project

Objectives selected to carry out the purposes of the study were to determine within the Fargo and West Fargo metropolitan area the:

1. Approximate number and distribution of agricultural employees within selected occupational categories in agriculture.
2. Willingness of selected agricultural business representatives to play an active role in the vocational agribusiness programs of the Fargo Public Schools.
3. Value selected employers place on 44 agricultural competency clusters arranged according to general subject area.
4. Agribusiness competency clusters considered necessary or useful for job entry by a majority of the agribusiness managers surveyed.
5. Agricultural competency clusters deemed necessary or useful for job entry into designated types of employment as evaluated by agribusiness managers within each designated area.

Delimitations

1. The population of the study was delimited to agribusinesses and individuals located within the Fargo-West Fargo, North Dakota, metropolitan area judged by the writer to be agricultural in nature on the basis of advertising, company name or personal contact.

2. For the purpose of this study, the term agricultural occupations was delimited to those agribusiness and natural resource occupations included in the categories of agricultural credit, agricultural mechanics, agricultural products, agricultural supplies, horticulture, natural resources and conservation, and other agriculture, the latter being those firms not belonging to the aforementioned categories.

CHAPTER II

REVIEW OF LITERATURE

Studies have been made of off-farm agribusiness employment in recent years by people in education and private business.

Ralph S. Whiting, in remarks to delegates to the American Institute of Cooperation, July 31 to August 4, 1971, discussed costs of training employees and reasons for losses of employees. He stated:

> The training of these people (those who quit work) seems to be the major cause of the turnover. In each case the person found the job too demanding for his ability or inadequate for his ability. In many cases improper placement contributed to the problem. The greatest problem in the training or re-training is in the social concepts.[1]

Social and managerial skills were considered important to agricultural employment by Masley in a study conducted in Connecticut in 1966:

> A total of 462 associations of job competency clusters were identified for all levels of employment for all occupational families. The competency cluster Business Organization and Supervision was associated with the greatest number of job clusters. . . .[2]

In a 1967 study of the Wahpeton, North Dakota area, Vallager concluded:

> The leadership abilities included in the study were rated highest in importance of any of the six areas included in the study.

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[1]Whiting, Ralph S., "Employers Viewpoint, What We Are Looking For," Remarks expressed at the American Institute of Cooperation, Colorado State University, Fort Collins, July 31 to August 4, 1971.

[2]Masley, P. T., The Development of a Curriculum for Non-Farm Agriculture Employment in Connecticut, Staff Study, University of Connecticut, Connecticut State Department of Education, Storrs, 1966, p. 42.

> Agricultural business abilities rated nearly as high as leadership abilities . . . the top ability--to meet and wait on customers.[3]

In addition to determining the types of skills necessary for employment in agricultural occupations, Mondart expressed the need for training workers prior to job entry in a study completed after studying 2,451 workers in Northwest Louisiana. He stated:

> Many of these workers did not experience specific training involving agricultural subjects appropriate to work performed. Management in all firms surveyed expressed repeatedly the need for workers with pre-job training to fill vacancies and new positions.[4]

In his recommendations for technical education curricula for Illinois, Arnold in 1965 concluded that managers and employees tend to make the same decisions regarding preparation for job entry:

> It is concluded that management supports the core programs in this study. The same findings support the conclusion presented under objective number one--that management and technitions views toward two year technical curricula are essentially the same.[5]

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[3]Vallager, Emil, An Evaluation of the Relative Importance Assigned to Selected Abilities by Employers in Nonfarm Agricultural Occupations in the Wahpeton, North Dakota Area, Unpublished M.S. Paper, North Dakota State University, Fargo, 1967, p. 7.

[4]Mondart, D. L., Sr., Curtis, C. M., and Dobbins, Loy H., Nonfarm Agricultural Employment in Northwest Louisiana--Area 1--with Implications for Developing Training Programs, Cooperative Research Project OE 5-85-040, Department of Vocational Agricultural Education, School of Vocational Education, College of Agriculture, Louisiana State University, Baton Rouge, 1967, p. 48.

[5]Arnold, Joseph P., A Study of Recommendations for Technical Education Curricula, Purdue University, Lafayette, 1965, p. 78.

CHAPTER III

METHOD OF RESEARCH

Identification of the Population

Identification of agribusiness firms within the Fargo and West Fargo metropolitan area was accomplished with the aid of the yellow pages of the local telephone directory, the commercial city directory, and by personal contact.

Method of Data Collection

Other studies reviewed were useful in designing the survey instrument. A questionnaire was developed to be mailed to businessmen. This method of data collection was selected due to the number of businesses to be studied and the time available to gather data. To facilitate identification of competency clusters, 44 clusters representing six broad subject areas within the field of agriculture were pre-selected for evaluation. They were judged to be representative of those taught in high school vocational agribusiness programs.

The proposed questionnaire was reviewed by Dr. Donald Priebe, Professor Shubel D. Owen, and three selected agribusinessmen. Recommendations received were incorporated into the final design of the instrument, a copy of which is included in Appendix A. A copy of the questionnaire, a cover letter, and a self-addressed stamped envelope were mailed to managers of 164 agribusiness firms judged by the writer to be employers of persons needing competencies in agriculture.

To increase the percentage of returns, approximately two weeks after the original mailing, a second mailing similar to the first was sent to those managers who had not replied. The data were gathered during June and July of 1972.

Of the 164 firms sent questionnaires, 128 or 78 per cent were returned. Of the 128 responses, 74 were considered valid, usable responses. They form the data upon which this study is based. Of the 54 responses which were not considered usable, 49 were from managers who did not consider their businesses to be agricultural in nature, three were returned from companies no longer in business, and two were duplications of valid responses which resulted when a business used more than one name.

CHAPTER IV

NUMBERS AND DISTRIBUTION OF AGRICULTURAL EMPLOYEES WITHIN 74 AGRIBUSINESS FIRMS IN FARGO AND WEST FARGO

This portion of the study attempted to determine the number of full-time and part-time employees working in 74 selected agribusiness firms in Fargo and West Fargo, North Dakota, who needed competence in agriculture as viewed by management representatives. Distribution of full-time and part-time employees within the seven occupational areas of agricultural credit, agricultural mechanics, agricultural products, agricultural supplies, horticulture, natural resources, and other agriculture was also studied.

Number of Full-Time and Part-Time Employees

Using categories of job classification adopted for this study, 19 of the 74 firms were classified within the group of agricultural products, 16 within the area of agricultural mechanics, 11 within the area of agricultural supplies, 9 within the area of agricultural credit, 6 within the area of horticulture, 5 in the area of natural resources, and 8 were included in the area of other agriculture (Table 1).

The managers of the 74 cooperating firms reported employing a total of 822 full-time and 424 part-time persons in jobs involving competence in agriculture. Accounting for the largest number of persons employed full-time in agriculture were businesses within the job categories of agricultural products with a total of 235 employees and

TABLE 1. DISTRIBUTION OF FULL-TIME AND PART-TIME EMPLOYEES NEEDING COMPETENCE IN AGRICULTURE IDENTIFIED IN 74 FARGO AND WEST FARGO AGRIBUSINESS FIRMS BY MANAGEMENT REPRESENTATIVES OF THOSE FIRMS

Occupational category	Firms per category	Number of employees needing competencies in agriculture	
		Full-time	Part-time
Agricultural credit banks, government lending agencies, insurance	9	74	84
Agricultural mechanics sales, repair or maintenance of agricultural equipment	16	230	61
Agricultural products processing, marketing of agricultural commodities	19	235	16
Agricultural supplies feed, seed, fertilizer, chemicals, livestock supplies	11	108	31
Horticulture production, sales, maintenance of turf, shrubs and plants	6	21	35
Natural resources conservation, utilization and management of resources	5	36	157[a]
Other agriculture government services, communications, etc.	8	118	40
Total	74	822	424

[a]Of the 157 part-time workers in this area, 150 were employed by the Fargo Park Board for maintenance.

agricultural mechanics with 230 persons employed full time. The total of 405 persons employed by firms in these two categories represents over 56 per cent of the 822 persons employed full time in jobs of an agricultural nature from among all occupational categories considered in this study. Reported as full-time employees in the various job categories were 108 persons in agricultural supplies, 74 persons in agricultural credit, 36 persons in natural resources, 21 persons in horticulture, and 118 persons in other agricultural jobs.

Of the 422 persons reported as employed on a part-time basis for the 74 firms included in the study, 157 were within the job category of natural resources with 150 of these persons employed by the Fargo Park Board. Part-time employment by other job categories included 84 in agricultural credit, 61 in agricultural mechanics, 35 in horticultural jobs, 31 in agricultural supplies, 16 in agricultural products, and 40 in other agricultural employment.

CHAPTER V

COMPARISON OF THE WILLINGNESS OF 74 AGRIBUSINESS EMPLOYERS TO TAKE AN ACTIVE ROLE IN THE VOCATIONAL AGRIBUSINESS PROGRAM OF THE FARGO PUBLIC SCHOOLS

It was the purpose of this section of the study to determine the willingness of agribusiness representatives to commit their firms to cooperatively participate in programs of vocational agribusiness offered by the Fargo Public Schools.

Respondents' Willingness to Allow Students to Visit and Observe Business Operations Individually or by Class Field Trips

Representatives of businesses in each of the categories were highly favorable toward permitting student visitation on an individual basis or as members of class groups (Figure 1). Management of all 16 businesses (100 per cent) in the agricultural mechanics category expressed a willingness to cooperate. Expressing a willingness to cooperate by permitting visitation by students were 83 per cent of the businesses in the horticulture category, 80 per cent of the businesses in natural resources and conservation, 73 per cent of the businesses in the category of agricultural supplies, 68 per cent of the businesses in agricultural products, 67 per cent of the agricultural credit businesses, and 75 per cent of the businesses grouped in the category of other agriculture.

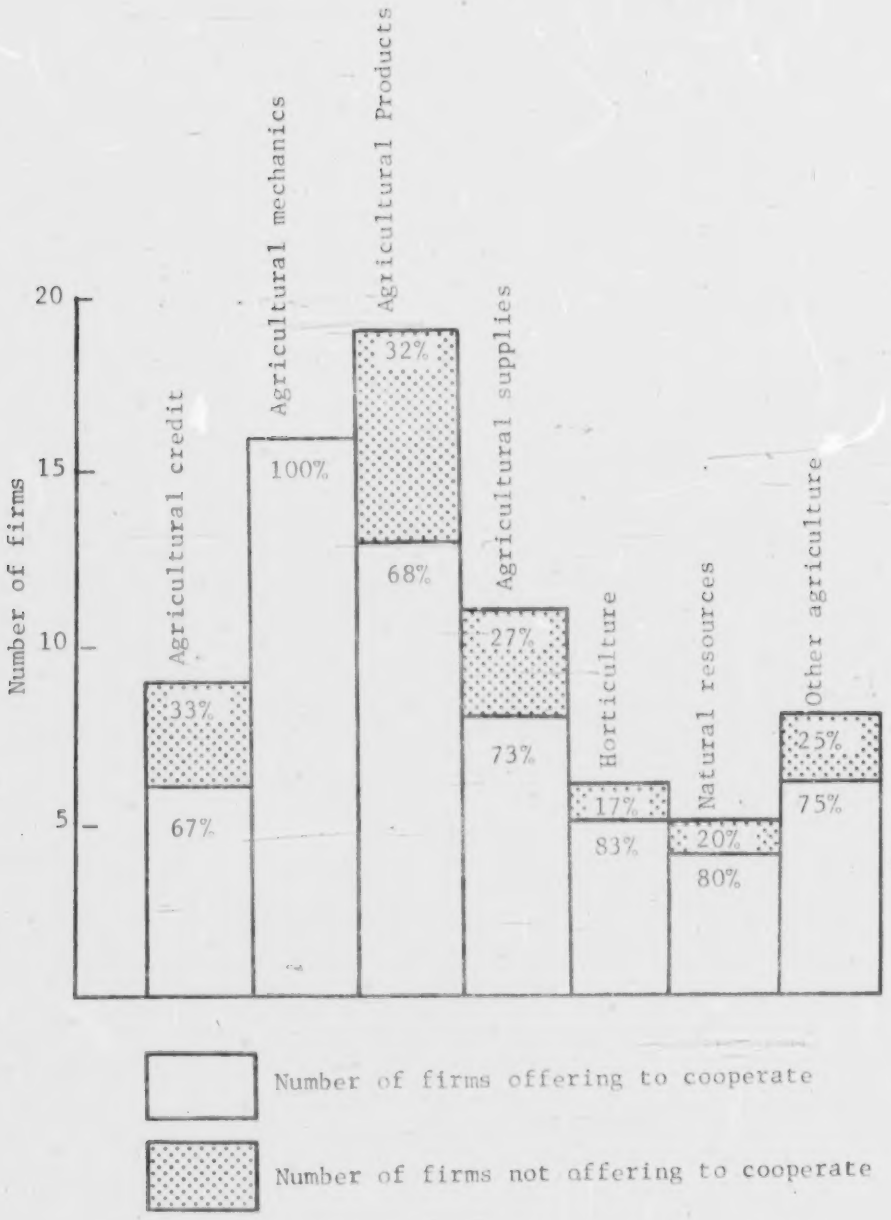

Figure 1. Willingness of 74 Agribusiness Firms to Allow Students to Visit and Observe the Business Operations Individually or by Class Field Trips

Willingness of 74 Agribusiness Firms to Cooperate in Employing Students as a Part of the Students' Supervised Occupational Experience Program

Managers of the 74 businesses participating in the study did not express a high willingness to cooperate with the school by accepting students for part-time work as a part of the students' supervised occupational experience program (Figure 2). A total of 17 (23 per cent of the 74 respondents) indicated a willingness to cooperate with the school by providing occupational training stations for students.

The managers of 5 of the 16 businesses in the category of agricultural mechanics (31 per cent) expressed a willingness to cooperate by providing work training stations. Expressing a willingness to provide training stations were 4 of the 11 managers of agricultural supply businesses (36 per cent), 4 of the 6 businesses classified in the category of horticulture (67 per cent), 2 of the 5 businesses classified as natural resources (40 per cent), and 1 each from the categories of agricultural credit (11 per cent of 9) and agricultural products (5 per cent of 19). None of the 8 businesses grouped in the category of other agriculture expressed a willingness to cooperate by providing training stations.

Willingness of 74 Agribusiness Firms to Loan Employees to Assist the School in Providing Instruction on a Short-Term Basis

A total of 23 (31 per cent) of the 74 managers included in the study expressed a willingness to loan employees to assist the school in providing short-term instruction (Figure 3).

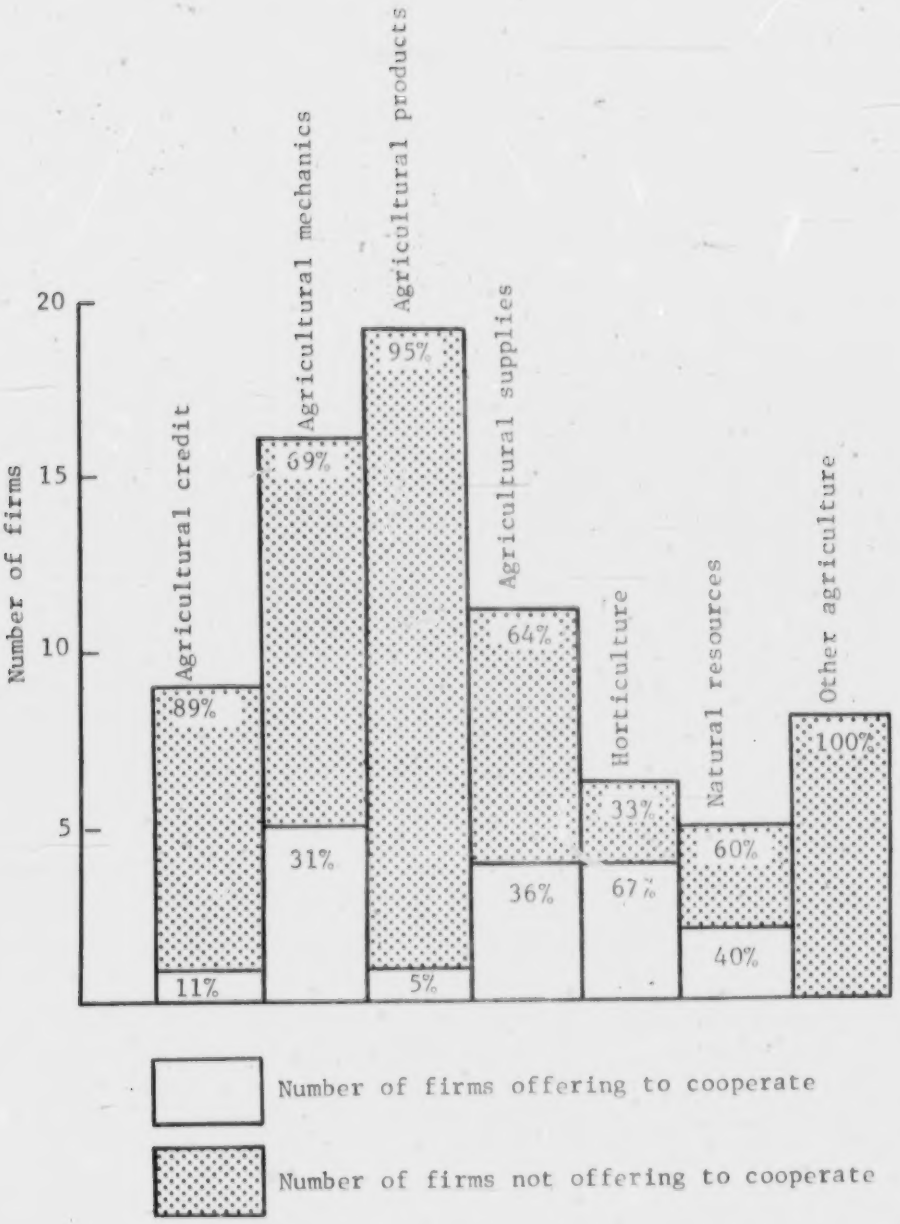

Figure 2. Willingness of 74 Agribusiness Firms to Cooperate in Employing Students as a Part of the Students' Supervised Occupational Experience Program

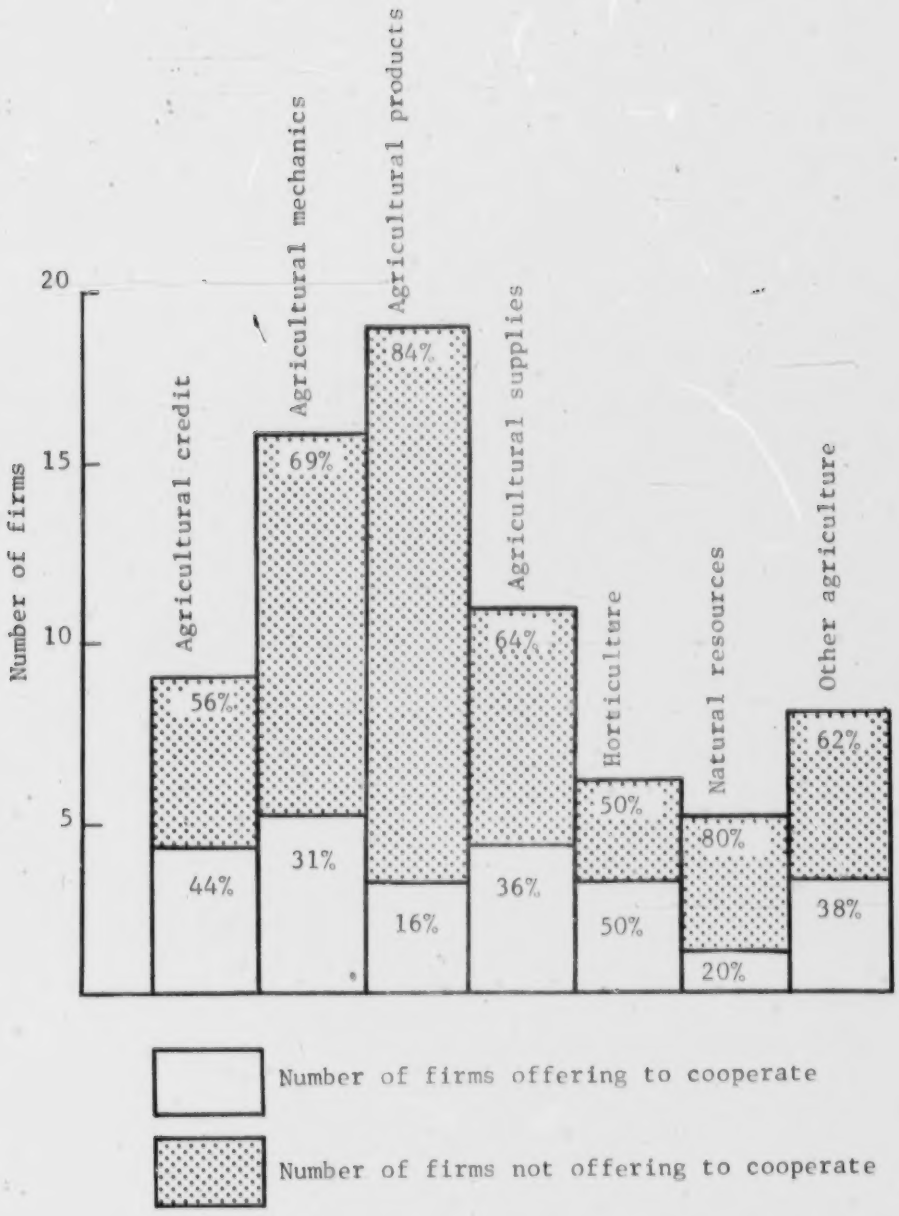

Figure 3. Willingness of 74 Agribusiness Firms to Loan Employees to Assist the School in Providing Instruction on a Short-Term Basis

One half (3) of the horticultural business managers expressed a willingness to loan employees to the school on a short-term basis for the purpose of providing instruction. Indicating a willingness to assist the school by allowing employees to teach specialized subjects on a short-term basis were 4 of the 9 managers from agricultural credit businesses (44 per cent), 4 of the 11 managers of agricultural supply businesses (36 per cent), 5 of the 16 representatives of agricultural mechanics firms (31 per cent), 1 of 5 managers in the category of natural resources (20 per cent), and 3 of the 19 agricultural products business managers (16 per cent). Three of the 8 representatives from firms included in the category other agriculture (38 per cent of the total) were willing to loan employees to assist the school in providing instruction on a short-term basis.

CHAPTER VI

AGRICULTURAL COMPETENCY CLUSTERS REGARDED NECESSARY OR USEFUL FOR JOB ENTRY EMPLOYMENT BY MANAGEMENT REPRESENTATIVES OF 74 FARGO AND WEST FARGO AGRIBUSINESS FIRMS

It was the intent of this portion of the study to determine the frequency of necessary and useful evaluations for job entry employment of 44 competency clusters in vocational agribusiness by management representatives of 74 cooperating agribusinesses. Respondents evaluated the importance of competency clusters on the basis of the value each had in relation to job entry into the firms represented. Competency clusters were grouped into the areas of agribusiness management and marketing, agricultural mechanics, animal science, plant science (field crops), plant science (horticulture), and natural resources. Respondents evaluated the importance of competency clusters by indicating them to be necessary, useful but not necessary, or neither necessary nor useful for job entry.

Agribusiness Management and Marketing

A high percentage of managers indicated that a job applicant's knowledge of competency clusters within the area of agribusiness management and marketing was an important consideration when hiring someone to work in their own business (Table 2). Most frequently evaluated (49 per cent of the 74 respondents) as a necessary employee trait was knowledge and ability in the human relations cluster. The second most frequently evaluated cluster was records, accounts and budgeting. It

TABLE 2. AGRIBUSINESS COMPETENCY CLUSTERS IN THE AREA OF AGRIBUSINESS MANAGEMENT AND MARKETING REGARDED NECESSARY OR USEFUL FOR JOB ENTRY EMPLOYMENT BY MANAGEMENT REPRESENTATIVES OF 74 FARGO AND WEST FARGO AGRIBUSINESS FIRMS

	Necessary evaluations		Useful evaluations	
Competency cluster	Number of respondents	Per cent of respondents	Number of respondents	Per cent of respondents
Human relations	36	49	21	28
Records, accounts & budgeting	31	42	19	26
Agricultural salesmanship	28	38	20	27
Business organization	27	36	19	26
Agricultural finance & insurance	25	34	19	26
Business forms & ordering	25	34	17	23
Labor management	20	27	17	23
Advertising display & promotion	17	23	29	39
Using business machines	17	23	26	35

was considered a necessary job qualification by 42 per cent of the 74 respondents. There was little difference in the frequency of selection between the next four competency clusters in the agribusiness area when evaluated on the basis of being necessary for job entry employment. The clusters with their respective evaluation percentages include agricultural salesmanship (38 per cent), business organization (36 per cent), agricultural finance and insurance (34 per cent), and business forms and ordering (34 per cent). Other competency clusters considered within the area were labor management (27 per cent), advertising, display, and promotion (23 per cent), and using business machines (23 per cent).

Respondents had an alternative selection to indicate importance of competency clusters when hiring new workers for their business. Not only could they select them as being necessary, they could also indicate clusters to be useful to job success rather than necessary. Given this choice, the largest percentage of managers evaluated advertising, display and promotion as a useful but not necessary competency cluster with 39 per cent so responding. Thirty-five per cent thought using business machines was a useful rather than necessary competency cluster. Both of these clusters were chosen least often as necessary within the agribusiness management and marketing area, but many managers thought them to be useful if not necessary for employment in their business. The other competency clusters considered within the area were evaluated useful but not necessary by 23 to 28 per cent of the respondents.

Agricultural Mechanics

All competency clusters within the category of agricultural mechanics were evaluated necessary for job employment by less than one fourth of the 74 managers included in the study (Table 3). Their evaluation was based upon competencies needed for job entry into the firms they represented.

The competency cluster most frequently evaluated necessary from among those in the category was agricultural power and machinery. This competency cluster was evaluated necessary for job entry by 17 (23 per cent) of the managers. The cluster of set-up and machine adjustment was identified second most often when evaluated on necessity for job entry. Fourteen (19 per cent) of the managers indicated it to be so. Considered by managers nearly as often as necessary for employment were the competency clusters of shop skills and of parts department services. Each was evaluated as necessary by 18 per cent of the managers. Other clusters considered were agricultural buildings and conveniences and utilization of electric power, which were considered necessary for job entry by nine (12 per cent) and eight (11 per cent) of the respondents, respectively.

In evaluating competency clusters, managers could indicate them to be useful but not necessary. The cluster most frequently indicated to be useful but not necessary was agricultural buildings and conveniences, with 17 (23 per cent) so designated and, although considered most often as useful, it had been evaluated next to the least often as a necessary cluster for job entry employment. The cluster of shop skills was identified by 15 managers (20 per cent) as being useful rather than necessary for employment. Other clusters within the agricultural

TABLE 3. AGRIBUSINESS COMPETENCY CLUSTERS IN THE AREA OF AGRICULTURAL MECHANICS REGARDED NECESSARY OR USEFUL FOR JOB ENTRY EMPLOYMENT BY MANAGEMENT REPRESENTATIVES OF 74 FARGO AND WEST FARGO AGRIBUSINESS FIRMS

Competency cluster	Necessary evaluations		Useful evaluations	
	Number of respondents	Per cent of respondents	Number of respondents	Per cent of respondents
Agricultural power & machinery	17	23	12	16
Set-up & machine adjustment	14	19	12	16
Shop skills	13	18	15	20
Parts department services	13	18	10	14
Agricultural buildings & conveniences	9	12	17	23
Utilization of electric power	8	11	11	15

mechanics category were specified as useful but not necessary for job entry by 10 (14 per cent) to 12 (16 per cent) of the respondents.

Animal Science

Within the area of animal science, the competency cluster evaluated necessary for job entry by the largest number of management representatives was the cluster of management of livestock operations (Table 4). It was deemed necessary by 18 (24 per cent) of the respondents. The cluster of marketing of livestock products was considered to be necessary for job entry by 16 (22 per cent) of the managers. Nearly as many had the opinion that the cluster of livestock handling was necessary with 15 (20 per cent) so indicating. The competency cluster of livestock feeding and nutrition was evaluated necessary by 14 (19 per cent) of the management representatives. Eleven of the respondents evaluated the competency cluster of sanitation, disease, and parasite control as necessary for job entry into their businesses. Other clusters considered within the area of animal science were the clusters of housing and equipment, of processing of livestock products, and of breeding farm animals.

Only the competency cluster of housing and equipment was evaluated useful but not necessary for job entry by more than one fourth of the respondents. Representatives of 21 (28 per cent) businesses placed it in the useful category. All other clusters within the category were identified as useful but not necessary by 23 per cent or fewer of the respondents.

TABLE 4. AGRIBUSINESS COMPETENCY CLUSTERS IN THE AREA OF ANIMAL SCIENCE REGARDED NECESSARY OR USEFUL FOR JOB ENTRY EMPLOYMENT BY MANAGEMENT REPRESENTATIVES OF 74 FARGO AND WEST FARGO AGRIBUSINESS FIRMS

Competency cluster	Necessary evaluations		Useful evaluations	
	Number of respondents	Per cent of respondents	Number of respondents	Per cent of respondents
Management of livestock operations	18	24	12	16
Marketing of livestock products	16	22	15	20
Livestock handling	15	20	16	22
Livestock feeding and nutrition	14	19	14	19
Sanitation, disease, parasite control	11	15	16	22
Housing and equipment	9	12	21	28
Processing of livestock products	9	12	17	23
Breeding farm animals	9	12	15	20

Plant Science (Field Crops)

Each of the six competency clusters considered within the area of field crops was judged to be necessary for job employment by less than 20 per cent of the 74 management representatives (Table 5). The clusters considered within this area were thought to be useful rather than necessary for job entry by 20 to 28 per cent of the respondents.

Most frequently evaluated as necessary was the cluster of management of grain production, which was evaluated necessary by 14 (19 per cent) of the respondents. The competency clusters of marketing grain and of seed production and marketing were specified as necessary by 11 (15 per cent) of the 74 management representatives. Nine representatives (12 per cent) considered the clusters of pest control and of plant propagation and growth necessary.

All competency clusters considered within the area of plant science were most often evaluated as useful but not necessary by the 74 representatives. The competency cluster of pest control was considered to be useful but not necessary for employment by 20 (27 per cent) of the managers. Other clusters considered to be useful but not necessary were those of management of grain production, evaluated useful by 18 (24 per cent); of plant propagation and growth; of marketing of grain, both evaluated useful but not necessary by 16 (22 per cent); and of seed production and marketing, considered useful by 15 (20 per cent) of the respondents.

TABLE 5. AGRIBUSINESS COMPETENCY CLUSTERS IN THE AREA OF PLANT SCIENCE (FIELD CROPS) REGARDED NECESSARY OR USEFUL FOR JOB ENTRY EMPLOYMENT BY MANAGEMENT REPRESENTATIVES OF 74 FARGO AND WEST FARGO AGRIBUSINESS FIRMS

Competency cluster	Necessary evaluations		Useful evaluations	
	Number of respondents	Per cent of respondents	Number of respondents	Per cent of respondents
Management of grain production	14	19	18	24
Marketing grain	11	15	16	21
Seed production and marketing	11	15	15	20
Processing and handling products	9	12	21	28
Pest control	7	9	20	27
Plant propagation and growth	7	9	16	22

Plant Science (Horticulture)

With the exception of the cluster of pest control, all competency clusters within the area of horticulture were most frequently evaluated by agribusiness representatives as useful rather than necessary for job entry (Table 6).

The cluster of pest control was considered necessary for job entry by 12 (16 per cent) of the 74 managers. The cluster of growing media and environmental control was considered to be necessary by nine (12 per cent) of the respondents, and the competency cluster of plant propagation was evaluated as necessary for job entry by eight (16 per cent) of the respondents. Less than 10 per cent of the business representatives participating in the study considered the clusters of management of horticultural operations, of horticulture products marketing, of greenhouse management, of landscape design, and of turf management to be necessary for job entry employment.

The competency cluster of landscape design was the most frequently evaluated as useful but not necessary for job entry. It was considered to be useful by 13 (18 per cent) of the respondents.

Natural Resources

Management representatives more frequently evaluated the competency clusters within the area of natural resources to be useful rather than necessary for job entry preparation (Table 7). The competency cluster of soil science and fertilization was most often evaluated as being necessary for employment by 13 (18 per cent) of the respondents.

TABLE 6. AGRIBUSINESS COMPETENCY CLUSTERS IN THE AREA OF PLANT SCIENCE (HORTICULTURE) REGARDED NECESSARY OR USEFUL FOR JOB ENTRY EMPLOYMENT BY MANAGEMENT REPRESENTATIVES OF 74 FARGO AND WEST FARGO AGRIBUSINESS FIRMS

Competency cluster	Necessary evaluations		Useful evaluations	
	Number of respondents	Per cent of respondents	Number of respondents	Per cent of respondents
Pest control	12	16	11	15
Growing media & environmental control	9	12	10	1
Plant propagation	8	11	8	1
Management of horticulture operations	6	8	10	14
Horticulture products marketing	5	7	10	14
Greenhouse management	4	5	10	14
Landscape design	3	4	13	18
Turf management	3	4	8	11

TABLE 7. AGRIBUSINESS COMPETENCY CLUSTERS IN THE AREA OF NATURAL RESOURCES REGARDED NECESSARY OR USEFUL FOR JOB ENTRY EMPLOYMENT BY MANAGEMENT REPRESENTATIVES OF 74 FARGO AND WEST FARGO AGRIBUSINESS FIRMS

Competency cluster	Necessary evaluations		Useful evaluations	
	Number of respondents	Per cent of respondents	Number of respondents	Per cent of respondents
Soil science and fertilization	13	18	16	22
Land measurement and surveying	10	14	11	15
Pollution and environmental control	7	9	16	22
Water management, use, irrigation	7	9	14	19
Range management	5	7	11	15
Forestry	5	7	5	7
Wildlife and game management	3	4	9	12
Park and recreation management	1	1	8	11

Land measurement and surveying was considered to be necessary by the second largest number of management representatives with 10 (14 per cent) so designating it. Other clusters were evaluated as being necessary for job entry by less than 10 per cent of the 74 respondents. The two least necessary clusters for job entry were wildlife and game management and park and recreation management. The clusters of soil science and fertilization and of pollution and environmental control were considered to be useful but not necessary for job entry by 16 (22 per cent) of the managers. The cluster of water management, use, and irrigation was evaluated as useful rather than necessary by 14 (19 per cent) of the respondents. Evaluated as useful but not necessary for job entry by 11 (15 per cent) of the respondents were the clusters of land measurement and surveying and of range management.

CHAPTER VII

AGRIBUSINESS COMPETENCY CLUSTERS EVALUATED EITHER NECESSARY OR USEFUL FOR JOB ENTRY BY 50 PER CENT OR MORE OF 74 AGRIBUSINESS MANAGEMENT REPRESENTATIVES

The determination of competency clusters common to many types of agricultural employment was the purpose of this section of the study. Those competency clusters which were thought either necessary or useful but not necessary for employment by 50 per cent or more of the respondents are shown in Table 8.

TABLE 8. AGRIBUSINESS COMPETENCY CLUSTERS EVALUATED EITHER NECESSARY OR USEFUL FOR JOB ENTRY BY 50 PER CENT OR MORE OF 74 AGRIBUSINESS MANAGERS

	Combined necessary & useful evaluations	
Competency cluster	Number of respondents	Per cent of respondents
Human relations	57	77
Records, accounts & budgeting	50	68
Agricultural salesmanship	48	65
Business organization	46	62
Advertising, display & promotion	46	62
Agricultural finance, credit & insurance	44	60
Using business machines	43	58
Business forms, receipts & ordering	42	57
Labor management	37	50

All nine clusters evaluated by 50 per cent or more of the participants to be necessary or useful for job entry were contained in the general area of agribusiness management and marketing. More than three

fourths (77 per cent) of the respondents considered a knowledge of human relations to be important for job applicant preparedness. The cluster of records, accounts, and budgeting was evaluated necessary or useful by 68 per cent of the agribusiness managers.

Other clusters evaluated by 50 per cent or more of the 74 respondents as necessary or useful for job entry were the clusters of agricultural salesmanship (66 per cent), of business organization (62 per cent), of advertising, display and promotion (62 per cent), of agricultural finance, credit and insurance (60 per cent), of using business machines (58 per cent), of business forms, receipts, and ordering (57 per cent), and of labor management (50 per cent). Appendix B lists the 44 competency clusters included in the study along with the combined percentage of necessary and useful evaluations of each.

CHAPTER VIII

AGRIBUSINESS COMPETENCY CLUSTERS REGARDED NECESSARY FOR JOB ENTRY INTO DESIGNATED TYPES OF EMPLOYMENT BY MANAGERS OF BUSINESSES WITHIN THE DESIGNATED AREAS

The purpose of this part of the study was to determine competency clusters considered by management representatives to be most important for job entry into the occupational categories of agricultural credit, agricultural mechanics, agricultural products, agricultural supplies, horticulture, natural resources, and other agricultural occupations. Businesses were grouped into occupational categories on the basis of the products sold or services offered. The competency clusters most frequently evaluated as necessary for each of the occupational categories are shown in Tables 8 through 14 inclusive.

Agricultural Credit

The competency clusters of agricultural finance and of records, accounts and budgeting were regarded necessary for job entry into agricultural credit employment by 78 per cent of the nine managers representing businesses that were agricultural credit in nature (Table 9). No other clusters were evaluated as necessary by a majority of the managers. Three clusters were considered as necessary by 44 per cent of the managers. They were the clusters of management of livestock operations, of business organization, and of business forms, receipts and ordering.

TABLE 9. MOST FREQUENTLY SELECTED COMPETENCY CLUSTERS REGARDED BY REPRESENTATIVES OF NINE AGRICULTURAL CREDIT FIRMS TO BE NECESSARY FOR EMPLOYMENT IN THEIR BUSINESSES

Competency cluster	Necessary evaluations	
	Number	Per cent
Agricultural finance	7	78
Records, accounts, budgeting	7	78
Management of livestock operations	4	44
Business organization	4	44
Business forms, receipts, ordering	4	44

Agricultural Mechanics

Three competency clusters were considered necessary for job entry by 63 per cent of the 16 managers of agricultural mechanics businesses (Table 10). The clusters were parts department services, human relations, and agricultural power and machinery. The competency cluster of agricultural salesmanship was deemed necessary by one half of the respondents with the clusters of business organization, of shop skills, and of set-up and machine adjustment evaluated necessary by 44 per cent of the 16 managers.

TABLE 10. MOST FREQUENTLY SELECTED COMPETENCY CLUSTERS REGARDED BY REPRESENTATIVES OF 16 AGRICULTURAL MECHANICS FIRMS TO BE NECESSARY FOR EMPLOYMENT IN THEIR BUSINESSES

Competency cluster	Necessary evaluations	
	Number	Per cent
Parts department services	10	63
Human relations	10	63
Agricultural power & machinery	10	63
Agricultural salesmanship	8	50
Business organization	7	44
Shop skills	7	44
Set-up & machine adjustment	7	44

Agricultural Products

None of the competency clusters evaluated by the 19 managers of agricultural products businesses were considered by a majority as necessary for job entry (Table 11). The competency cluster evaluated most often as a necessary employment qualification was the cluster of marketing of livestock products, considered by 47 per cent of the managers in this category to be necessary. Evaluated by 42 per cent of the agricultural products managers to be necessary for job entry was the cluster of livestock handling. The competency clusters of human relations and of management of livestock operations were evaluated necessary for job entry by 37 per cent of the products respondents, while the clusters of records, accounts and budgeting and of livestock feeding were considered necessary by 32 per cent of the respondents within the category of agricultural products.

TABLE 11. MOST FREQUENTLY SELECTED COMPETENCY CLUSTERS REGARDED BY REPRESENTATIVES OF 19 AGRICULTURAL PRODUCTS FIRMS TO BE NECESSARY FOR EMPLOYMENT IN THEIR BUSINESSES

Competency cluster	Necessary evaluations	
	Number	Per cent
Marketing of livestock products	9	47
Livestock handling	8	42
Human relations	7	37
Management of livestock operations	7	37
Records, accounts, budgeting	6	32
Livestock feeding	6	32

Agricultural Supplies

The competency cluster of agricultural salesmanship was evaluated by 82 per cent of the 11 managers of agricultural supply firms as being necessary for job entry into agricultural supply employment (Table 12). Considered important were skills in the cluster of human relations, a cluster which 64 per cent of the respondents indicated necessary. Considered necessary for job entry by 55 per cent of the managers of agricultural supply businesses were the clusters of business forms, of records, accounts and budgeting, and of business organization.

TABLE 12. MOST FREQUENTLY SELECTED COMPETENCY CLUSTERS REGARDED BY REPRESENTATIVES OF 11 AGRICULTURAL SUPPLY FIRMS TO BE NECESSARY FOR EMPLOYMENT IN THEIR BUSINESSES

Competency cluster	Necessary evaluations	
	Number	Per cent
Agricultural salesmanship	9	82
Human relations	7	64
Business forms, receipts, ordering	6	55
Records, accounts, budgeting	6	55
Business organization	6	55

Horticulture

Three competency clusters were evaluated by four (67 per cent) of the six horticulture business representatives as being necessary for job entry in horticultural occupations (Table 13). They were the clusters of growing media and environmental control, of pest control in horticulture, and of plant propagation. Human relations, evaluated by 50 per cent, was the only other cluster considered necessary for job entry by at least

one half of the respondents. The clusters of greenhouse management; of horticulture products marketing; of records, accounts and budgeting; and of labor management were considered for job entry by 33 per cent of the managers of horticulture businesses.

TABLE 13. MOST FREQUENTLY SELECTED COMPETENCY CLUSTERS REGARDED BY REPRESENTATIVES OF SIX HORTICULTURAL FIRMS TO BE NECESSARY FOR EMPLOYMENT IN THEIR BUSINESSES

	Necessary evaluations	
Competency cluster	Number	Per cent
Growing media & environmental controls	4	67
Pest control in horticulture	4	67
Plant propagation	4	67
Human relations	3	50
Greenhouse management	2	33
Horticulture products marketing	2	33
Records, accounts & budgeting	2	33
Labor management	2	33

Natural Resources

Three of the five (60 per cent) natural resource business representatives evaluated that for job entry the following competency clusters were necessary: human relations, land measurement, surveying and leveling, agricultural salesmanship, advertising and display, and agricultural finance (Table 14). Other competency clusters considered were evaluated necessary for natural resource employment by 40 per cent or fewer managers of businesses classified within the area.

TABLE 14. MOST FREQUENTLY SELECTED COMPETENCY CLUSTERS REGARDED BY REPRESENTATIVES OF FIVE NATURAL RESOURCES FIRMS TO BE NECESSARY FOR EMPLOYMENT IN THEIR BUSINESSES

Competency cluster	Necessary evaluations	
	Number	Per cent
Human relations	3	60
Land measurement, surveying	3	60
Agricultural salesmanship	3	60
Advertising & display	3	60
Agricultural finance	3	60

Other Agriculture

Included in the category of other agriculture were eight agribusinesses which provided government services, private information services, and inspection services. The respondents showed little agreement in competency clusters evaluated necessary for job entry. One half (50 per cent) of the group considered the cluster of labor management necessary for employment (Table 15). Thirty-eight per cent indicated the following nine clusters to be necessary for job entry: human relations; business organizations; management of grain products; using business machines; marketing grain; management of livestock operations; livestock handling; business forms, receipts and ordering; and pollution and environmental control.

TABLE 15. MOST FREQUENTLY SELECTED COMPETENCY CLUSTERS REGARDED BY REPRESENTATIVES OF EIGHT OTHER AGRICULTURE FIRMS TO BE NECESSARY FOR EMPLOYMENT IN THEIR BUSINESSES

Competency cluster	Necessary evaluations	
	Number	Per cent
Labor management	4	50
Human relations	3	38
Business organization	3	38
Management of grain production	3	38
Using business machines	3	38
Marketing of grain	3	38
Management of livestock operations	3	38
Livestock handling	3	38
Business forms, receipts, ordering	3	38
Pollution & environmental controls	3	38

CHAPTER IX

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Significance of the Study

The North Dakota State Board for Vocational Education, the Department of Agricultural Education of North Dakota State University, and the Fargo, North Dakota, Public Schools in 1970 initiated an exemplary program at the senior high level in agribusiness and natural resources. The goals of the exemplary program included the exploration of the agricultural labor market near the school and the developing of curricula in agribusiness and natural resources to fit the labor needs. This study was undertaken to assist in meeting those goals and to increase the effectiveness of teaching career information in the Fargo Public Schools.

Purpose and Objectives of the Study

The major purpose and objectives of the study were to determine opportunities for using local business places as centers for student-learner employment, the willingness of employers to take part in other types of school teaching involvement, and the relative importance of 44 selected agricultural competency clusters for job entry into agricultural businesses.

Method of Gathering Data

Questionnaires were mailed to managers of 164 agricultural businesses in the Fargo and West Fargo, North Dakota, metropolitan

area. Seventy-four of the returned questionnaires were selected as usable for this study.

Numbers and Distribution of Agricultural Employees within 74 Agribusiness Firms in Fargo and West Fargo, North Dakota

A total of 822 full-time and 424 part-time employees were reported to be working for the 74 agribusiness firms surveyed. The most full-time employees were hired by firms in the categories of agricultural products (235 employees) and agricultural mechanics (230 employees). The fewest number of full-time employees were employed by firms in the occupational category of horticulture (21 employees).

The most part-time employees were hired by firms within the occupational categories of agricultural credit (84 employees), agricultural mechanics (61 employees), and natural resources (157 employees). The number of part-time employees in the occupational category of natural resources was due to the employment of 150 maintenance persons by the Fargo Park Board.

Comparison of the Willingness of 74 Agribusiness Employers to Take an Active Role in the Vocational Agribusiness Program of the Fargo Public Schools

Of the 74 agribusiness managers, 58 were willing to allow students to visit their places of business as a part of the students' regular class experiences, 17 expressed a willingness to employ student-learners in their business as a part of the school supervised occupational experience program, and 23 were willing to allow their employees to assist the school with short-term instruction.

Agricultural Competency Clusters Regarded Necessary or Useful for Job Entry Employment by Management Representatives of 74 Fargo and West Fargo Agribusiness Firms

This section of the study dealt with the importance of competency clusters for job entry employment in 74 Fargo and West Fargo agribusiness firms. Competency clusters were arranged according to subject areas to facilitate evaluation and reporting.

All clusters in the subject area of agribusiness management and marketing were evaluated as necessary or useful for prospective employees by a large percentage of the respondents. Evaluated most often as useful or necessary for job entry from among the nine agribusiness management and marketing clusters was the cluster of human relations.

The competency cluster of agricultural power and machinery was the most commonly evaluated necessary cluster from among six agricultural mechanics clusters. The most often evaluated useful but not necessary competency cluster from among those in the agricultural mechanics area was agricultural buildings and conveniences.

Considered by the largest number of managers to be necessary for job entry from among eight animal science competency clusters was the cluster of management of livestock operations. Considered necessary by somewhat less respondents were the clusters of marketing livestock products, of livestock handling, and of livestock feeding and nutrition.

Each of the six competency clusters considered within the area of field crops was evaluated necessary for job entry by less than 20 per cent of the 74 respondents. The competency cluster of management of grain production was the most commonly evaluated as necessary for job entry from the field crops area.

The eight competency clusters within the area of horticulture were more often indicated useful rather than necessary for job entry employment by the 74 agribusiness respondents. Evaluated necessary by the largest number of respondents was the competency cluster of pest control, and considered useful but not necessary by the most respondents was the cluster of landscape design.

A larger percentage of the agribusiness managers considered natural resources competency clusters useful rather than necessary for job entry employment. The cluster of soil science and fertilization was most often evaluated necessary of the eight clusters in the natural resources area.

Agribusiness Competency Clusters Evaluated Either Necessary or Useful for Job Entry by 50 Per Cent or More of 74 Agribusiness Management Representatives

The nine competency clusters within the area of agribusiness management and marketing were evaluated necessary or useful for job entry by a larger percentage of the respondents than were any other competency clusters evaluated. All agribusiness management and marketing clusters were considered necessary or useful for job entry by 50 per cent or more of the group. Particularly evaluated by a large number of respondents was the competency cluster of human relations, regarded by 77 per cent as necessary or useful.

Agribusiness Competency Clusters Regarded Necessary for Job Entry into Designated Types of Employment by Managers of Businesses within the Designated Areas

It was the purpose of this section of the study to determine the competency clusters considered necessary for job entry into designated types of employment. To accomplish this goal, the responses of 74 agribusiness managers were grouped into designated areas on the basis of the type of employment offered by their businesses.

Agricultural credit respondents indicated the competency clusters of agricultural finance and of records, accounts and budgeting necessary for job entry, with 78 per cent so evaluating.

In addition to agricultural mechanics clusters, agricultural mechanics representatives placed many agribusiness management and marketing clusters among the most frequently selected. The clusters of parts department services, of human relations, and of agricultural power and machinery were evaluated most often as necessary for job entry.

Representatives of agricultural products firms thought the competency clusters of livestock science and of agribusiness management and marketing important for job entry, with 47 per cent of the managers evaluating the cluster of marketing livestock products necessary for job entry.

More managers of agricultural supplies businesses considered the competency clusters of agricultural salesmanship and of human relations as important for job entry--more so than any other competency cluster. Eighty-two per cent of the representatives evaluated the cluster of agricultural salesmanship as necessary for job entry.

Horticultural representatives most frequently evaluated clusters within the areas of horticulture and agribusiness management and marketing as necessary for employment in their businesses. The clusters of pest control, of growing media, and of plant propagation were most often considered necessary by the horticulture respondents.

Clusters in the areas of management and marketing and of natural resources were most commonly evaluated necessary by the five representatives of natural resource firms, but there were not great differences between the most often evaluated clusters in order of importance.

Representatives from the area of other agriculture, a category which included government services and communications, did not single out clusters from any one category as necessary for employment, but tended to express very diverse evaluations. The cluster of labor management was most often evaluated necessary for job entry employment by the respondents grouped in the area of other agriculture.

Conclusions

The following conclusions were drawn from the data compiled in this study.

1. Management representatives in the survey area were generally willing to assist the school in providing centers for field trips; however, in order to place large numbers of student learners on jobs through school supervised occupational experience programs, more personal contact and explanation about the program may be necessary. The low willingness on the part of managers to allow students to be employed through supervised experience programs may be due to limited knowledge of the program.

2. Employment in firms that hired large numbers of part-time employees also tended to be more seasonal in nature, and may offer opportunities for placement of students during periods of peak employment.

3. Agribusiness management and marketing competency clusters were considered to be important for job entry by the managers of agribusinesses studied. Of special importance was the cluster of human relations.

4. The 44 competency clusters included in the study, with the exception of some agribusiness management and marketing clusters, were not commonly accepted as being important to all types of agribusiness jobs. While not important to all types of employment, many clusters were considered for employment in specialized areas. Horticulture competency clusters, for example, were very important for employment in a horticultural business.

5. Skill-type competency clusters were not commonly important for job entry to the majority of management representatives participating in the study. The type of competency cluster regarded most commonly by the managers to be necessary or useful for job entry employment were those competency clusters dealing with a person's ability to relate and to get along with others.

Recommendations

1. The North Dakota State Vocational Agriculture staff should review the finding of this study relative to employment opportunities and competency clusters needed for employment to aid in development of state curriculum policy.

2. Programs in agribusiness and natural resources offered by the

Fargo Public Schools should be evaluated and modified on the basis of:

a. Program offerings and how they fit the labor needs of the community as determined by this study

b. Course content and how it relates to the competency cluster findings of this report

c. What can be done to increase employer awareness and cooperation in joint school-business educational programs, including student placement in cooperative occupational experience programs?

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APPENDICES

APPENDIX A

QUESTIONNAIRE AND COVER LETTER

North Dakota State University
Department of Agricultural Education

Fargo Public Schools
Department of Natural
Resources / Agribusiness

A DETERMINATION OF INSTRUCTIONAL COMMONALITIES IN AGRICULTURAL OCCUPATIONS IN THE FARGO-WEST FARGO METROPOLITAN AREA

Dear Sir:

It has been recommended that you or a representative of your business may be of assistance to the Fargo Public Schools in the development of a better curriculum in Agribusiness and Natural Resources Education.

As a joint effort between the Fargo Public Schools and North Dakota State University, it is requested that you take a few minutes to complete this form and return it to me in the enclosed stamped, addressed envelope. All replies will be kept confidential and no publication will be made identifying information about your individual business.

For the purpose of this study, Agriculture shall be thought to include the following eight areas: 1) Production, 2) Horticulture, 3) Agricultural Mechanics, 4) Natural Resources and Conservation, 5) Forestry, 6) Agricultural Supplies, 7) Agricultural Products, and 8) Professional Agriculture.

If none of your business is agricultural in nature, please complete only SECTION A and return this form.

Thank you for your time and consideration.

Sincerely,

Michael Anderson, Instructor
Agribusiness and Natural Resources

Dr. Donald Priebe
Chairman, Agricultural Education
North Dakota State University

Dr. Vernon Bennett
Superintendent
Fargo Public Schools

CONFIDENTIAL

SECTION A

I. Name of Business _____

II. Address: _____ Phone: _____

III. Manager: _____

IV. Person Completing Form: _____

V. Position: _____

VI. Estimated per cent of business Agricultural in nature:

_____ 0-20% _____ 20-40% _____ 40-60% _____ 60-80% _____ 80-100%

VII. Major agricultural products and/or service of business:

_____

_____

VIII. Total employees in this business or service: Full time _____

Part time _____

SECTION B: COMPLETE THE FOLLOWING FOR EMPLOYEES NEEDING COMPETENCIES IN AGRICULTURE

Agricultural Job Titles	Number of Employees	
	Full Time	*Part Time*
1.		
2.		
3.		
4.		
5.		
6.		

IX. Willingness to participate in school-employer educational programs (Check all that apply)

_____A. Allow students to visit and observe the business operations as prearranged either individually or by class field trips.

_____B. Employ students through school supervised, on-the-job experience programs.

_____C. Loan employees to assist the school in providing instruction on a short term basis.

SECTION C: AGRICULTURAL UNITS OF INSTRUCTION WHICH MAY BENEFIT THE AGRICULTURAL WORKERS AS IDENTIFIED IN SECTION B.

Place a check (✓) in the appropriate column ONLY if you believe an item to be either Necessary or Useful for job entry. If you do not believe an item to be Necessary or Useful, leave the column blank and go on to the next item.

Necessary	Useful	
		I. ANIMAL SCIENCE
		A. Breeding farm animals
		B. Livestock feeding and nutrition
		C. Sanitation, disease, and parasite control
		D. Housing and equipment
		E. Management of livestock operations
		F. Processing of livestock products (meat, milk, etc.)
		G. Marketing of livestock products (meat, milk, etc.)
		H. Livestock handling
		II. PLANT SCIENCE (FIELD CROPS)
		A. Plant propagation and growth
		B. Seed production and marketing
		C. Pest control (insects, diseases, weeds, and rodents)
		D. Management of grain production operations
		E. Marketing of grain
		F. Processing and handling products
		III. PLANT SCIENCE (HORTICULTURE)
		A. Plant propagation
		B. Greenhouse management
		C. Growing media and environmental control
		D. Pest control (insects, diseases, weeds, and rodents)
		E. Horticulture products marketing
		F. Management of horticulture production operations
		G. Landscape design
		H. Turf management

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Necessary	Useful	IV. NATURAL RESOURCES AND CONSERVATION
		A. Land measurement, surveying, and leveling
		B. Water management, use, and irrigation
		C. Soil science and fertilization
		D. Park and recreation management
		E. Pollution and environmental control
		F. Wildlife and game management
		G. Range management
		H. Forestry

		V. AGRIBUSINESS MANAGEMENT AND MARKETING
		A. Human relations
		B. Agricultural salesmanship
		C. Advertising, display and promotion
		D. Records, accounts, budgeting and analysis
		E. Agricultural finance, credit and insurance
		F. Labor management
		G. Business organization
		H. Using business machines (cash register, etc.)
		I. Business forms, receipts, and ordering

		VI. AGRICULTURAL MECHANICS
		A. Agricultural power and machinery
		B. Agricultural buildings and conveniences
		C. Utilization of electrical power
		D. Shop skills (welding, carpentry, use of tools, etc.)
		E. Set-up and machine adjustment
		F. Parts department services

OTHER AGRICULTURAL COMPETENCIES NEEDED: _____

APPENDIX B

COMPETENCY CLUSTERS NECESSARY OR USEFUL

COMPETENCY CLUSTER EVALUATIONS ARRANGED BY
COMBINED PERCENTAGE OF NECESSARY
AND USEFUL

Competency cluster	Per cent
Human relations	77
Records, accounts, and budgeting	68
Agricultural salesmanship	65
Business organization	62
Advertising, display, and promotion	62
Agricultural finance, credit, and insurance	60
Using business machines	58
Business forms, receipts, and ordering	57
Labor management	50
Management of grain production	43
Marketing of livestock products	42
Livestock handling	42
Management of livestock operations	40
Soil science and fertilization	40
Processing and handling crop products	40
Livestock housing and equipment	40
Agricultural power and machinery	39
Livestock sanitation, disease, and parasite control	37
Marketing of grain	36
Pest control in field crops	36
Set-up and machine adjustment	35
Seed production and marketing	35

Competency cluster	Per cent
Agricultural buildings and conveniences	35
Processing of livestock products	35
Parts department services	32
Breeding farm animals	32
Pest control in horticulture	31
Field crop plant propagation and growth	31
Pollution and environmental control	31
Land measurement, surveying, and leveling	28
Water management, use, and irrigation	28
Horticulture growing media and controls	26
Utilization of electrical power	26
Horticulture plant propagation	22
Management of horticultural production	22
Range management	22
Landscape design	22
Horticultural products marketing	21
Greenhouse management	19
Wildlife and game management	16
Turf management	15
Forestry	14
Park and recreation management	12

APPENDIX C

SUMMARY OF RESPONSES

SUMMARY OF RESPONSES

Number of evaluations			
Necessary	Useful	Total	I. ANIMAL SCIENCE
9	15	24	A. Breeding farm animals
14	14	28	B. Livestock feeding and nutrition
11	16	27	C. Sanitation, disease, and parasite control
9	21	30	D. Housing and equipment
18	12	30	E. Management of livestock operations
9	17	26	F. Processing of livestock products (meat, milk, etc.)
16	15	31	G. Marketing of livestock products (meat, milk, etc.)
15	16	31	H. Livestock handling
			II. PLANT SCIENCE (FIELD CROPS)
7	16	23	A. Plant propagation and growth
11	15	26	B. Seed production and marketing
7	20	27	C. Pest control (insects, diseases, weeds, and rodents)
14	18	32	D. Management of grain production operations
11	16	27	E. Marketing of grain
9	21	30	F. Processing and handling products
			III. PLANT SCIENCE (HORTICULTURE)
8	8	16	A. Plant propagation
4	10	14	B. Greenhouse management
9	10	19	C. Growing media and environmental control
12	11	23	D. Pest control (insects, diseases, weeds and rodents)
5	10	15	E. Horticulture products marketing
6	10	16	F. Management of horticulture production operations
3	13	16	G. Landscape design
3	8	11	H. Turf management

Necessary	Useful	Total	IV. NATURAL RESOURCES AND CONSERVATION
10	11	21	A. Land measurement, surveying, and leveling
7	14	21	B. Water management, use, and irrigation
13	16	29	C. Soil science and fertilization
1	8	9	D. Park and recreation management
7	16	23	E. Pollution and environmental control
3	9	11	F. Wildlife and game management
5	11	16	G. Range management
5	5	10	H. Forestry
			V. AGRIBUSINESS MANAGEMENT AND MARKETING
36	21	57	A. Human relations
28	20	48	B. Agricultural salesmanship
17	29	46	C. Advertising, display and promotion
31	19	50	D. Records, accounts, budgeting and analysis
25	19	44	E. Agricultural finance, credit and insurance
20	17	37	F. Labor management
27	19	46	G. Business organization
17	26	43	H. Using business machines (cash register, etc.)
25	17	42	I. Business forms, receipts, and ordering
			VI. AGRICULTURAL MECHANICS
17	12	29	A. Agricultural power and machinery
9	17	26	B. Agricultural buildings and conveniences
8	11	19	C. Utilization of electrical power
13	15	28	D. Shop skills (welding, carpentry, use of tools, etc.)
14	12	26	E. Set-up and machine adjustment
13	10	23	F. Parts department services